Useful Kinks for the Car Owner

A Prize of $10 Is Awarded Each Month for the Best Idea or Suggestion of Practical Value to Motorists

CARRYING water in a hat, shoe, or even in the bowl of a headlight are possible methods whereby water can be put into the radiator in an emergency. But it is much more satisfactory to do the job by the ingenious method shown in Figure 1. The device consists of a three-foot piece of discarded inner tube. One end is folded back on itself and bound tightly by a rubber band cut from the remaining part of the tube to one end of a thirty-inch piece of broomstick. The other end of the tube is rolled back on itself, like a cup, and the turned end stretched over the free end of the stick.

The capacity of the bucket, if a five-inch tube is used, is approximately eight quarts. The use of a stick in this way makes the improvised bucket easier to carry, permits control while pouring, and holds the tube extended to simplify filling in either standing or running water.

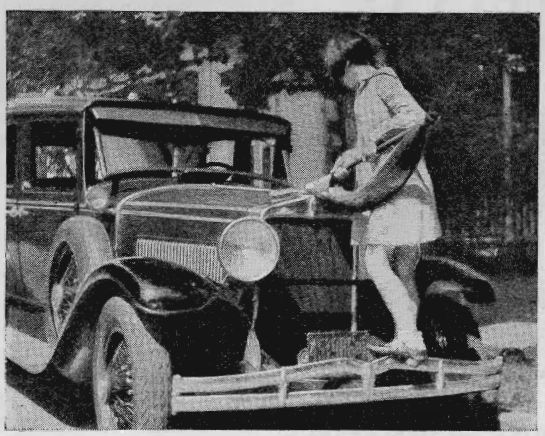


Fig. 1. A discarded inner tube fastened to a broomstick serves as an emergency bucket for filling the auto radiator.

Drying Ignition Wires

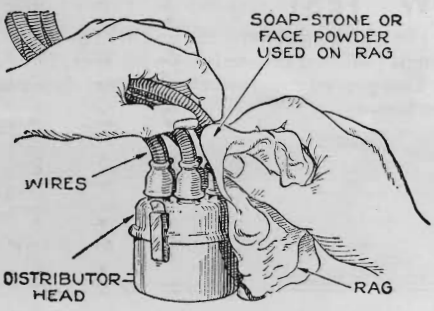


Fig. 2. Drying high tension wires with powder-coated rag avoids short circuits from moisture.

A SHORT in the high tension wires leading to the spark plugs, caused by moisture, usually occurs where the wires are clustered together.

When this happens, dry the wires, one at a time, as in Figure 2, with a cloth on which is placed a generous amount of either soapstone powder or face powder, preferably soapstone. In drying the wires entering the distributor cap be careful not to remove more than one wire at a time unless it is well understood how to replace them.

Keeping the wires and the outside of the distributor cap exceptionally clean and using soapstone in the manner described will result in keeping the rubber insulation in good condition and no trouble will be experienced from rain. Of course, this suggestion applies only to ordinary rubber-covered high tension wire. Special high tension wire covered with varnished fabric should not be treated in this way. Such wire should be wiped with a clean dry cloth only.

Hood Scratch Preventers

THE enamel on the auto radiator and cowl frequently is scratched by raising and lowering the hood carelessly. Such scratches can be prevented by attaching small leather "fenders" to the corners of the hood, as shown in Figure 3. They are made from sheet leather about two inches square, folded over as indicated, and riveted to the corners of the hood. Besides preventing scratches when the hood is raised or lowered these fenders also decrease hood rattle when the hood clips are loose.

The Prize Winner

A WOODEN block and two ordinary nails can be fashioned into the handy spark plug tester shown in Figure 4. It is the idea of Carl Rutledge of Wauna, Ore., and wins this month's prize of $10. First bore the hole as indicated, and then drive two nails through diagonally so that their points will approach within an eighth of an inch of each other. The nails are set at such an angle that the heads rest on the spark plug terminals.

The higher the engine's compression ratio, the greater should be the gap between the nails to test the spark plugs fairly. One eighth of an inch will do under average conditions. If the spark jumps between the nail points it is an indication that the spark plug is not short-circuited or carbonized.

Water Level Indicator

THE indicator illustrated in Figure 5 gives definite warning when the water level in the radiator gets too low. This diagram shows only the principle of the device for the contact must be arranged to suit different radiator caps. A cork float on the end of a rod should be used

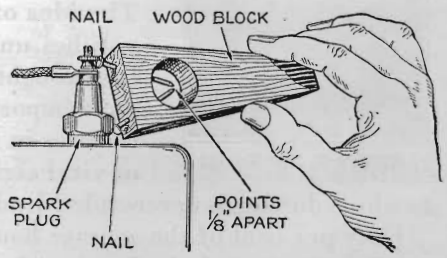
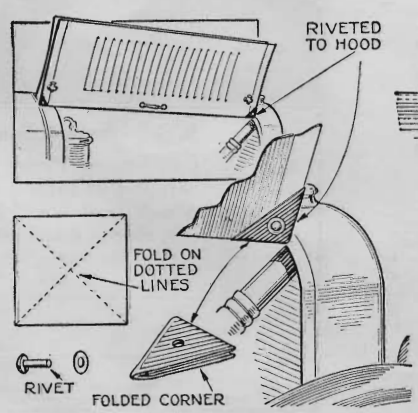


Fig. 4. Testing a spark plug with nails driven in block. The spark jumps between nail points.

and a short length of copper or brass tubing should be soldered in place against the hole in the radiator cap to act as a guide and keep the float rod in a vertical position.

A disk on the upper end of the rod makes contact with a wire and thereby grounds it when the water level goes too low. One terminal of a double contact indicator bulb on the dash should be connected with the current supply and the other terminal with the wire that makes contact with the float disk. If the cap unscrews, arrange the contact wire so that it can be swung out of the way. If the cap turns back on a hinge the contact can be fastened to a piece of fiber or bakelite and connected by a piece of flexible wire.



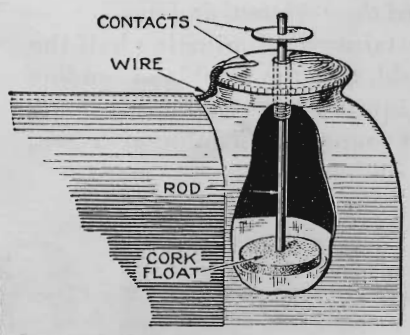


Fig 3 (left). How to make and attach leather hood "fenders" to prevent scratches. Fig. 5 (above). An indicator to warn when water in radiator is low.

Ever Drive into the Garage Wall?

How to Build a Timber Stop That May Save a Costly Crash—Other Ideas Car Owners Have Found Useful

MOST home garages are lightly constructed. While strong enough to resist ordinary strain, the entire back wall of the garage may be wrecked by a blow from the car bumper so light that the bumper itself is not damaged.

Figure 1 shows how to make a stop to avoid such trouble. A six by six timber long enough to extend ten inches on each side of the wheels can be bolted permanently with lag screws into a wooden floor or into expansion shields in holes in a concrete floor. To make the stop removable, ten-inch pieces of one-inch diameter pipe can be set into the floor to form sockets into which three-quarter-inch pieces of pipe will fit.

The three-quarter-inch pieces of pipe will make a drive fit in an $^{11}/_{16}$-inch hole drilled through the timber. Be sure to plane off the sharp edge of the timber toward the garage door so that the tires will strike against a flat surface instead of a sharp edge. If the floor space is somewhat restricted, make the bumper removable so as to facilitate tire changes and work under the rear of the car.

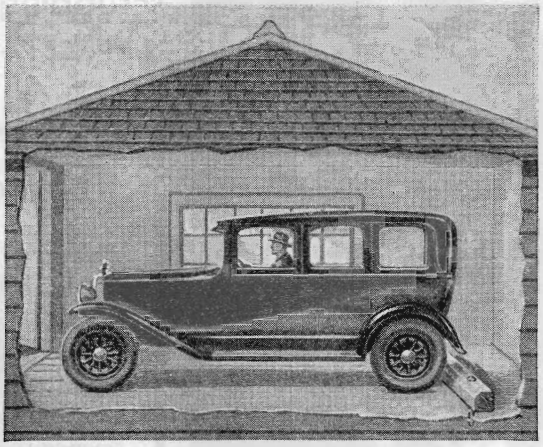


Fig. 1. A timber stop, bolted to the floor at rear of the garage, prevents ramming the rear wall when driving in.

Repairing Broken Brush Springs

SOMETIMES a break in a spring that presses a brush against the commutator on the starting motor makes the starter inoperative. Figure 2 shows a temporary repair. Cut a strip of rubber from an inner tube and pass it through the openings in the motor frame as shown. Pull fairly tightly and tie a knot. The rubber band will press the brush against the commutator and permit the motor to start the engine in normal fashion.

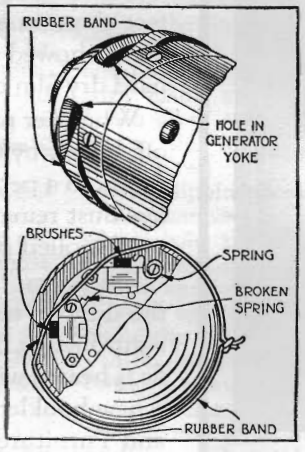


Fig. 2. Broken brush spring is repaired with rubber band.

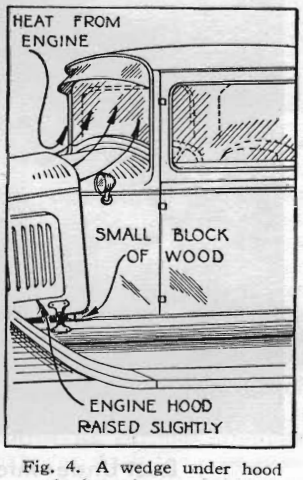


Fig. 4. A wedge under hood sends hot air to windshield.

Mousetrap Burglar Alarm

AN ORDINARY mousetrap (Figure 3) can be converted into an effective auto burglar alarm. Two wires with spring clips attached to their outer ends are attached as indicated. One clip is attached to the live terminal of the horn and the other to the metal frame of the car. When the trap is set the circuit is open. When sprung, the circuit is closed and the horn blows continuously. The trap can be placed so that moving either the steering arm or clutch pedal will spring the trigger.

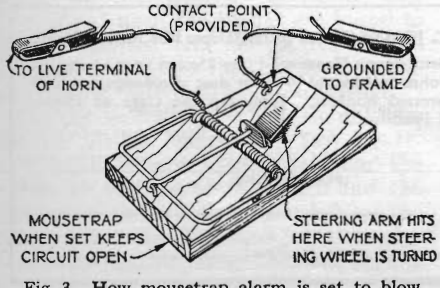


Fig. 3. How mousetrap alarm is set to blow the horn if thief moves the steering wheel.

Each month POPULAR SCIENCE MONTHLY awards a prize of $10, in addition to regular space rates, for the best idea for motorists. This month's prize goes to Harold Beedle, Clear Lake, Ia., for his suggestion for keeping the windshield clear (shown in Figure 4).

Clearing the Windshield

A CONSTANT stream of warm air can be directed against the windshield to prevent fogging and frosting (Figure 4). Raise the rear edge of the engine hood on each side enough to insert a small block of wood. This will produce an opening along the top rear edge of the hood through which heated air from the engine flows and strikes the glass. If trouble is experienced with rattling, an extra block of wood of the right size should be placed directly under the edge of the hood near the hinge. Experience will show what size block to use for best results.

Simple Hood Rest

FIGURE 5 shows an easy way to make a rest for the hood when it is opened. The only mechanical work needed is the hack-sawed slot in the edge of the cowl and two holes for bolts that hold the angle pieces to the dash. The straight piece and the two angle pieces are stock items from standard toy mechanical construction sets.

Cut the slot in the cowl first and then locate the angle pieces so that the perforated straight piece will swing into the slot in the up position or hang down out of the way when not in use. At least two hood rests will be required, one on each side; some hoods will require four.

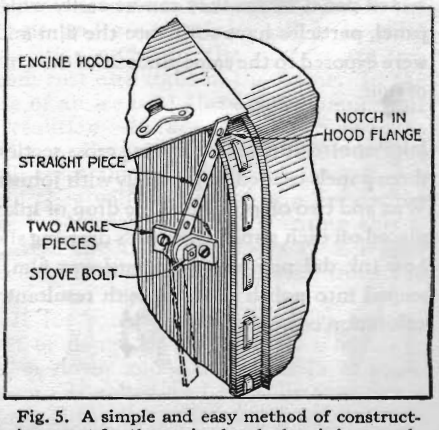


Fig. 5. A simple and easy method of constructing a rest for the engine hood when it is opened.

Useful Kinks for the Car Owner

IF THE car is kept in an unheated garage, a motor cover arranged as shown in Fig. 1 will promote easy starting in many cases. Of course it will do no good if the car is not used for days at a time, but if it is operated daily, enough heat will remain in the motor overnight to make it start easier. Use a wooden frame from which to suspend a very thick hood cover made of old blankets and quilting. The counterweight should be heavy enough so that the cover will stay either down or up as desired; in other words, it should exactly equal the weight of the frame and the hood cover.

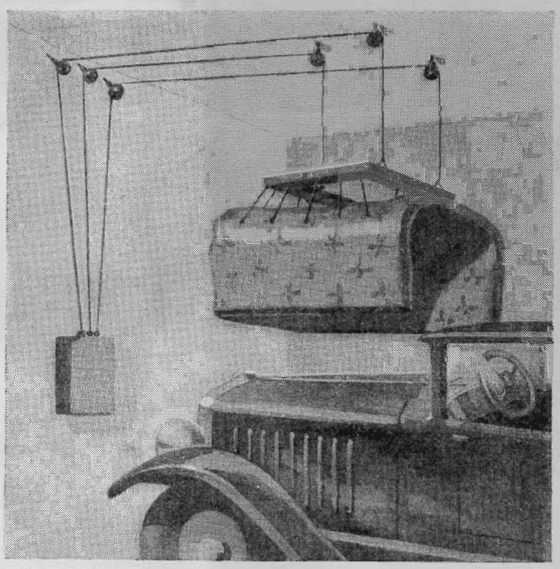


Fig. 1. When the car is put to bed, this thick hood quilt, lowered from the ceiling as shown, keeps the engine warm.

Insulating the Floor

Figure 2 illustrates a simple and inexpensive way to insulate the floor and help to keep the car warm. Sheets of corrugated cardboard cut from large packing cartons should be cut the right size using the floor mat as a pattern. Two or more layers will prove effective as heat insulation and, in addition, the noises that get into the closed body by way of the floor boards will be very noticeably reduced.

A Tin Can Cut-Out

An easily built and effective motor cut-out can be constructed from an old tin can and other discarded parts, as shown in Fig. 3. Remove the exhaust pipe and cut a large hole in it. Cut holes in the ends of the tin can so that it will slip over the pipe. Fit one bolt as a stop and another for the spring that pulls the can back over the hole when the valve stem on the end of the cord is allowed to slide into the hole in the dash. The hole in the exhaust pipe can be cut most easily by sawing a V-shaped notch in the pipe with a hack saw. Notch area should equal pipe cross section.

Each month POPULAR SCIENCE MONTHLY awards a prize of $10, in addition to regular space rates, for the best idea sent in for motorists. This month's prize goes to A. E. McCall, Seven Springs, N. C., for his suggestion for a tin can cut-out (shown in Figure 3) for a motor.

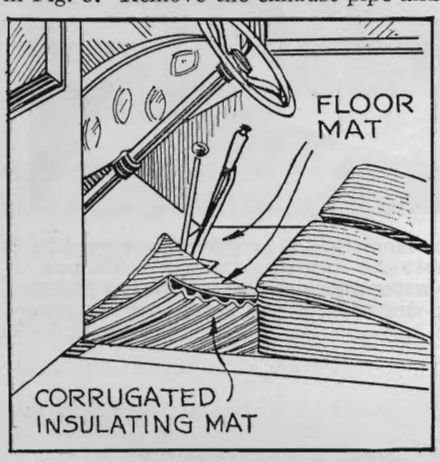


Fig. 2. Insulating corrugated cardboard fitted in place under floor mat keeps the car warm.

A Carburetor Control

Considerable gas can be saved by keeping the carburetor set to the thinnest mixture that will give steady running. The hand control shown in Fig. 4 makes this possible. It is made from a discarded speedometer shaft, a brass collar, and a brass wheel from a toy construction set. The collar couples the lower end of the shaft to the needle valve and the brass wheel serves to turn the upper end.

Getting Out of a Rut

In localities where dirt or gravel roads are common, deep ruts with perpendicular sides will form during the freeze-and-thaw period of late winter. When one motorist meets another, both traveling in the same set of ruts, a pair of wedge shaped blocks, shown in Fig. 5, will facilitate climbing out to make passing possible. Size and angle depend on local conditions. Thin boards nailed together can be used.

Automatic Garage Light

A stop-light switch fastened to a beam and connected into the light circuit as shown in Fig. 6 will provide an automatic light for the garage. When car drives into the garage its front wheels switch on the light at the ceiling. A cord to the lever of the stop-light switch should be fastened to a board hinged to the floor in such a way that the front tires rolling on to it will pull the switch to the on position. A push button switch is included in the circuit, of course, to provide a ready means of turning off the light. If the weight of the board will not allow the spring to pull the switch up to the off position, use a suitable counterweight.

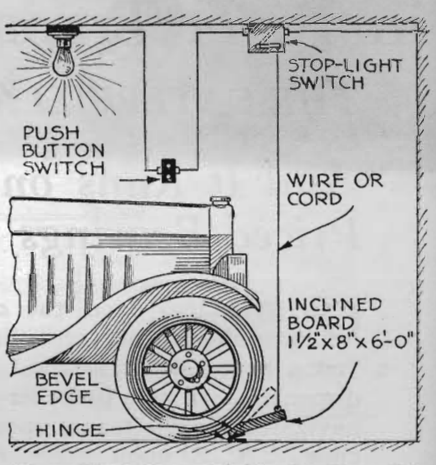


Fig. 6. When the car rolls into the garage, the front wheels turn on the electric ceiling light.

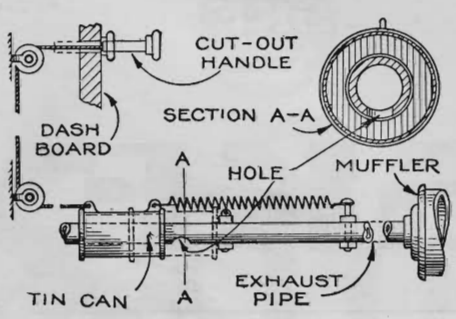


Fig. 3. How to make an effective motor cut-out, using an old tin can and other discarded parts.

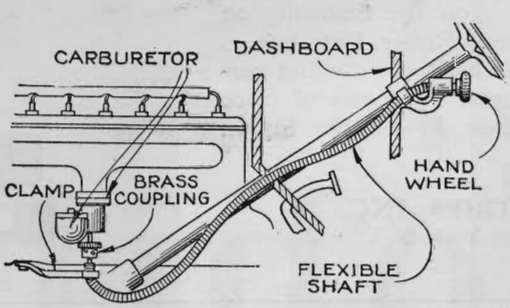


Fig. 4. This hand control enables the driver to set the carburetor at the right mixture.

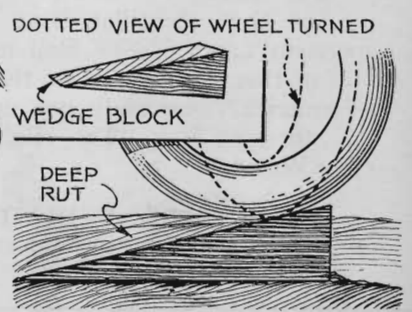


Fig. 5. A pair of wedge-shaped blocks like this helps the automobile climb out of a deep rut.

Helpful Ideas for the Car Owner

IF ALL roads were level and smooth, the problem of jacking up a front or back wheel to change tires would always be simple. Unfortunately, however, there are many times when the normal safe place for a tire change, off the paved portion of the road, presents unexpected difficulties. There may be a deep rut exactly where the jack should be placed, or the road may slope in such a way that the car is likely to roll off the jack. A pair of wood blocks shaped as shown in Fig. 1 will prove useful in such emergencies. One will serve as a chock for the car on a hill. Two, four, six, or even eight inches can be added to the height of the jack to reach up from a hollow depending on how the blocks are piled. The two blocks bolted together will support the front axle with both wheels off the ground when adjusting, greasing, and so on. For a large car or truck the blocks should measure approximately eight by twelve inches, with the thickness four inches at one end and two inches at the other.

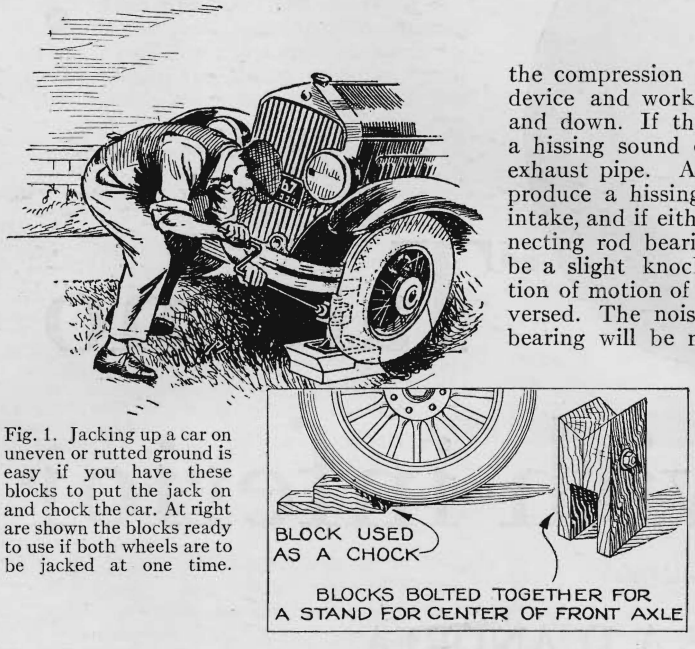


Fig. 1. Jacking up a car on uneven or rutted ground is easy if you have these blocks to put the jack on and chock the car. At right are shown the blocks ready to use if both wheels are to be jacked at one time.

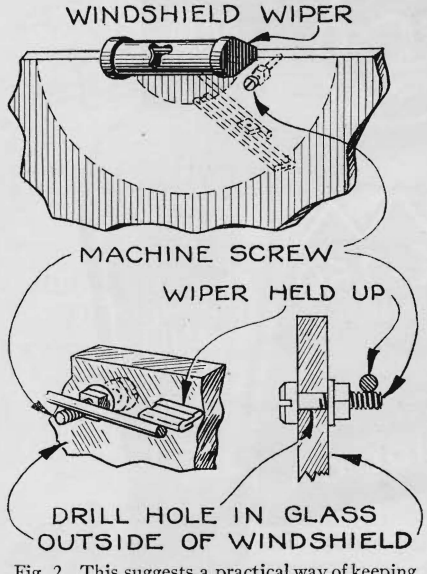


Fig. 2. This suggests a practical way of keeping the windshield wiper out of the line of vision.

Spring Holds Jack

THE ratchet type auto jack always seems to work out to its full length in the tool kit, causing a delay while it is racked back to its telescoped position. Figure 3 shows a way to overcome this trouble. A light spring is attached at one end to the head of the jack and at the other end to the toe.

Wiper Arm Holder

MANY types of windshield wipers cause trouble when not in use by slipping down into the line of vision. A simple and positive wiper holder is shown in Fig. 2. Drill a one-eighth-inch hole through the glass and fit a short screw and nut so that the end of the screw will project just enough to act as a retaining pin. While this arrangement necessitates reaching outside the windshield in closed cars, it is ideal, because of its neat appearance, on sport roadsters.

Pump Tests Loose Bearings

THE shell from a discarded spark plug, a brass nipple, and an old tire pump can be made up into a connecting rod and wrist pin bearing tester as shown in Fig. 4. The nipple should be screwed or soldered into the spark plug shell and into the end of the pump. The plunger of the pump should be removed and fitted with an extra washer in reversed position so that it will be air-tight when moved in either direction.

To use the device, remove the spark plug from one cylinder and turn the crank shaft till the piston is at the top of the compression stroke. Screw in test device and work the pump handle up and down. If the exhaust valves leak, a hissing sound can be heard from the exhaust pipe. A leaky inlet valve will produce a hissing at the carburetor air intake, and if either the wrist pin or connecting rod bearings are loose there will be a slight knock each time the direction of motion of the pump plunger is reversed. The noise produced by a loose bearing will be much more distinct if the test is made while the motor is hot after a trip. A cold motor may not give any loose bearing noise because of the congealed oil.

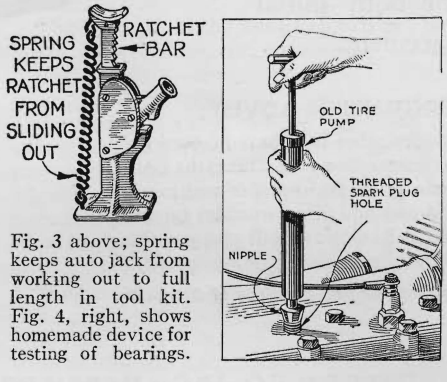


Fig. 3 above; spring keeps auto jack from working out to full length in tool kit. Fig. 4, right, shows homemade device for testing of bearings.

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Simple Test for Leaks

LEAKS in the cooling system are sometimes only apparent when the engine is operating, and the circulating water is hot. Such leaks are difficult to find and repair. The smallest leak, however, can be detected at once by applying air pressure to the cooling system. This may be done by using part of an old inner tube and a piece of cork. Use the cork to plug the overflow pipe and cut a circle of rubber from the inner tube with the valve at the center. Remove the filler cap and bind the section of the inner tube over the opening as shown in Fig. 5. Pressure is then applied with a tire pump. Only a few strokes are required. Be very careful not to apply too much pressure to avoid damaging the radiator. The radiator of an automobile is not designed to withstand pressure. Too much may open up a seam or bulge out the side of the upper or lower water tanks.

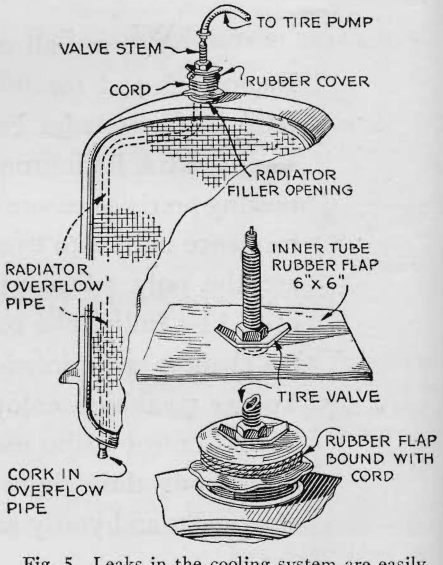

Fig. 5. Leaks in the cooling system are easily found when pressure is applied as shown here.

Useful Hints for Car Owners

Simple device will keep car from jamming hub caps and fenders—Poor-idling motor quickly cured with notch in butterfly valve—How leaky inlet guides may be fixed.

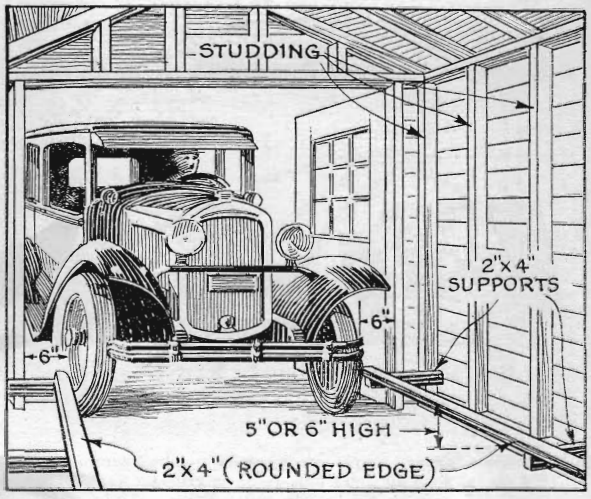

Fig. 1. Guide rails fitted in garage will keep car from the side walls.

BROKEN fenders and mashed hub caps often are caused by collision with the side walls in a narrow garage. Figure 1 shows how to prevent such trouble by fitting guide bars that will keep the car away from the walls or door jambs in driving in or backing out.

A couple of lengths of two-by-fours can be cut and mounted as shown in the illustration. Since it is desirable that the tires should not rub against the guide bars any more than necessary, place them just as close to the side walls as will insure keeping the mudguards, running boards, or hub caps from striking anything. If placed flat on the ground the two-by-fours will not prove effective because the tires will have a tendency to ride over them. On the other hand, if they are placed too high and the car is fitted with wire spoked wheels the spokes may be injured. Consider these factors when fitting them. Be sure to round off the edges of the two-by-fours against which the tires will rub and see that they are planed and sandpapered smooth. Also note that the guiding two-by-fours should be fastened to the supporting sections so the latter are one quarter to one half inch back of the edge of the guiding bar.

Curing Poor Idling

THE effective opening past the butterfly valve, to allow the motor to idle at a slow speed, is surprisingly small. After the car has been in use for several years, the shaft on which the butterfly is mounted and its bearings become worn. The result is that the butterfly never closes to the same position twice running; in addition, a considerable amount of air leaks through around the shaft bearings. A simple way to cure this trouble is to remove the adjusting screw entirely so that the butterfly closes tight. File a small notch in the edge of the butterfly valve as shown in Figure 2. This notch should be filed in the side of the butterfly valve on which the low speed nozzle is located and the size of the notch will govern the idling speed.

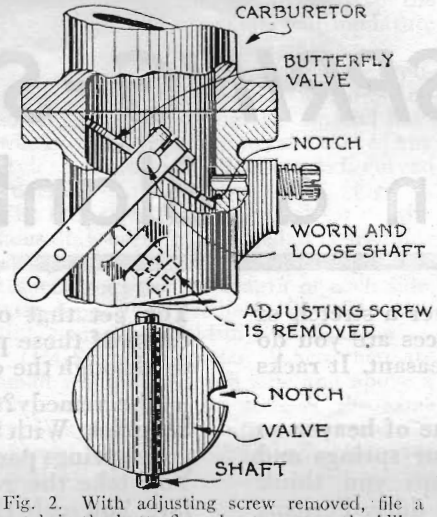

Fig. 2. With adjusting screw removed, file a notch in the butterfly valve to govern the idling speed of the motor, when the bearings admit air.

Wrench Holds Brake Pedal

A NOVEL and ingenious method of holding the brake pedal while adjustments are being made on the brakes is shown in Figure 3. By setting the wrench so that it is fairly tight on the clutch pedal shaft, it will hold the brake pedal at any desired position so that the point is easily found where the brakes first begin to take hold.

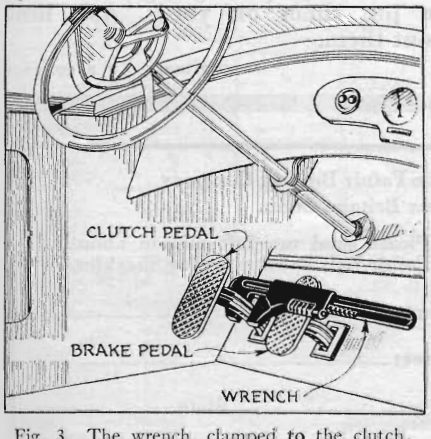

Fig. 3. The wrench, clamped to the clutch, holds brake pedal while adjustment is made.

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Curing Leaky Valve Guides

THE operation of a gasoline motor is not affected by leaky exhaust valve guides unless the wear is so bad that the valves do not properly seat, but leaky inlet guides cause irregular running at slow speeds and make it impossible to get the motor to idle smoothly. Figure 4 shows a way to eliminate this trouble. A light spring is fitted over the valve stem and a felt or leather washer is fitted on the stem with a hole that will just allow the valve stem to slide. It is a good idea to place a thin metal washer between the spring and the felt, although this washer is not shown in the illustration. The light spring will keep the washer pressing against the top of the guide and prevents air leakage and the consequent spoiling of the mixture. This suggestion should prove useful on old cars where the expense of new valve guides is not justified.

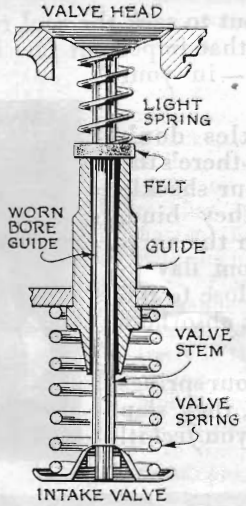


Fig. 4. Spring and washer on inlet guides stop leaks.

Wire Removes Broken Axle

WITH some types of rear axles it is difficult to remove the broken end without taking off the differential housing cover. Figure 5 shows how to accomplish this job without disturbing the cover. A loop is formed on the end of the wire as shown. The wire, of course, should be so stiff that the loop can be slipped down over the end of the axle. The slip noose arrangement will afford a sufficiently good purchase on the end of the axle to pull it out.

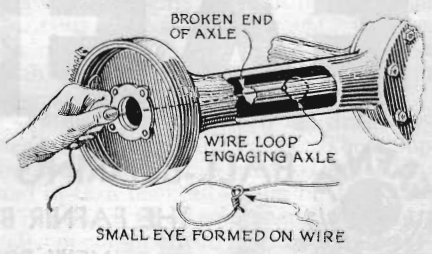


Fig. 5. A loop in a piece of stiff wire used to remove broken axle without disturbing cover.

Kinks Helpful to Car Owners

Work behind instrument panel made easy with small mirror. Cutout is used to operate spare tail-light.

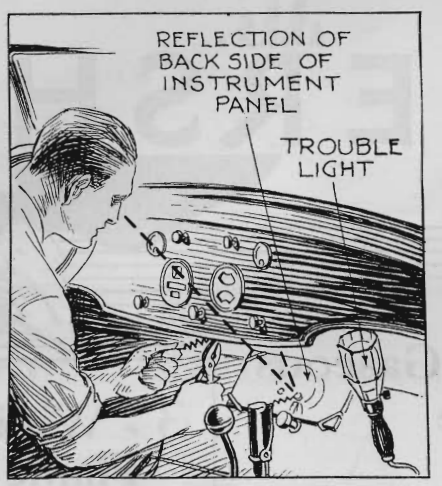


Fig. 1. Mirror can be used as shown when repair work is being done on dash instruments.

ALMOST the most awkward place around a car to do work is back of the instrument panel. Repairing the wiring of some of the dash instruments can be done quite easily with the aid of a mirror placed as shown in Fig. 1. Any convenient small mirror will do. Support it so that it will reflect to your eyes the image of the parts on which you want to work while you are comfortably seated in the front seat. Place a trouble light where it will illuminate the work.

Simple Ice Carrier

FIGURE 2 shows how to make an ice carrier from sheet iron about 3/16 inches thick. Bend it so that it fits over the edge of the running board, then drill straight through for a bolt which can be held in place with a wing nut. The two projections are formed with the aid of a cold chisel. If long pieces of ice are to be carried, it will be well to make two of the devices, spaced at the proper distances on the edge of the running board.

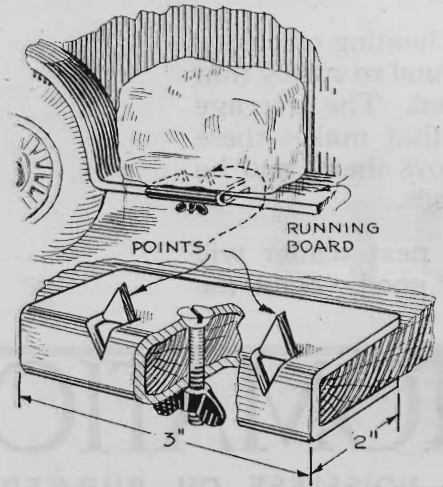


Fig. 2. Sheet iron, bent over running board and bolted down, makes a good ice carrier.

Foiling the Parts Thief

ANY device, such as a bumper, ordinarily can be removed by a thief equipped with a monkey wrench. However, few accessory thieves will attempt to remove anything that appears to be riveted to the frame or body of the car. You can fool the accessory thief by the method shown in Fig. 3, if the material is molded over the boltheads and nuts so as to resemble large rivets. After it is dry it should be painted to match the color of the surrounding metal parts.

Spare Tail-Light

UNLESS the tail-light is wired in series with the dash light and three-volt bulbs

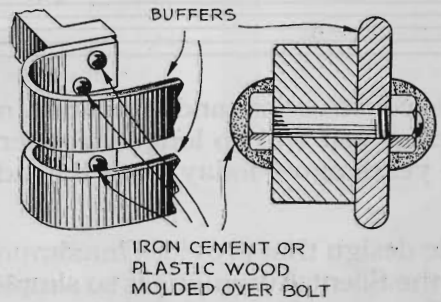


Fig. 3. Thieves are deceived if bolts are covered with iron cement and painted over.

are used at both points, the motorist has no way of knowing whether the tail-light is burning. Fig. 4 shows a way to wire a generator cutout and a spare tail-light so that the extra tail-light will light at once when the regular tail light bulb

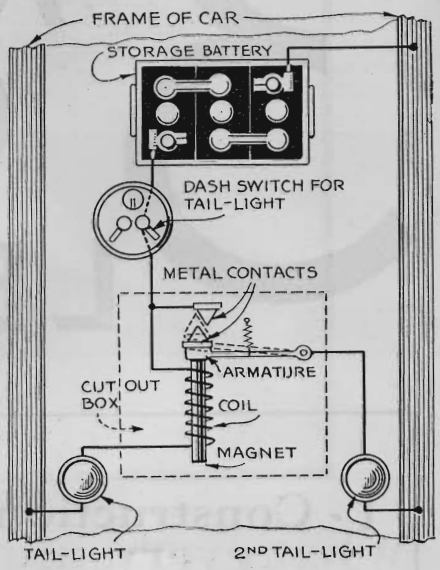


Fig. 4. Spare tail-light is wired to old generator cutout so that it will work automatically.

burns out. As soon as a new bulb is placed in the regular tail-light, the spare will automatically go out. As the diagram shows, current flowing through the cutout magnet winding by way of the regular tail-light keeps the circuit open, through which current can reach the spare tail-light. When the regular tail-light burns out, current stops flowing through the magnet and the circuit through the spare automatically closes.

Novel Valve Lifter

AN OLD hammer handle, part of a door hasp, two bolts and nuts, a piece of wire, and a curtain ring can be made into a satisfactory valve lifter as shown in Fig. 5. The ring is slipped over a cylinder-head bolt. Be sure to use strong wire.

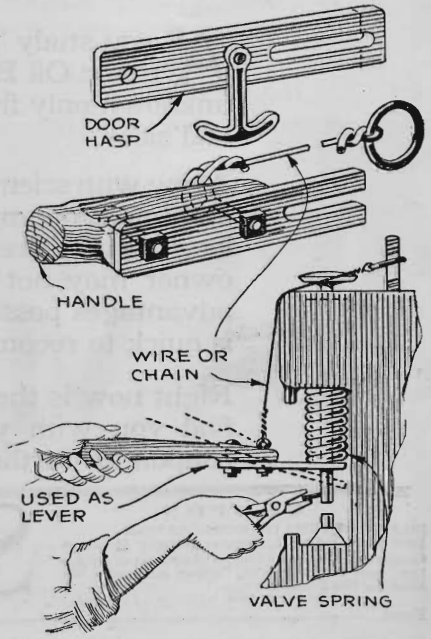


Fig. 5. Easy to make a valve lifter at home with hammer handle, bolts, ring, and bit of wire.

POPULAR SCIENCE MONTHLY awards each month a prize of $10, in addition to regular space rates, for the best idea sent in for motorists. This month's prize goes to Frank Curtis, Forest Hills, Ill., for his suggestion for a remedy for a defective tail-light circuit (shown in Figure 4, at upper right, and described in column two).

Novel Kinks to Use on a Car

Shellac as a cure for leaky gas tank —How to make arm rest for driver—Simple device to test valves

ALTHOUGH the driving position in modern motor cars is far more comfortable in many ways than it was in older type vehicles, few make provision for an arm rest for the driver. Figure 1 shows a simple arm rest designed to hook over the window regulator of the door at the driver's side. It consists of a sheet iron bracket to which is attached a padded wooden strip to form the arm rest. The length of the bracket and the dimensions of the arm rest must, of course, be arranged to suit the car.

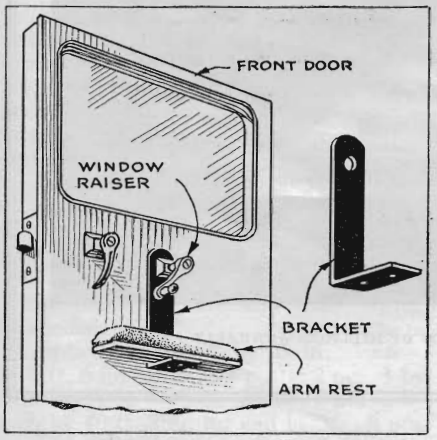


Fig. 1. A sheet iron bracket with padded wooden strip hooks on door to form driver's arm rest.

SIMPLE VALVE TESTER

WHILE there are excellent gages now being made for testing the tightness of a valve after grinding, the amateur auto mechanic can satisfactorily test valves after grinding by the arrangement shown in Figure 2. An ordinary thin rubber ball is cut in two very carefully so as to leave a clean edge. The valve is held off its seat while the inverted half of the ball is placed over it and squashed down. Then the valve is held tightly against the seat. If the valve is tight, the half ball cannot resume its shape.

Draining the gas tank, letting it stand until dry, and then coating with shellac stops leaks.

LEAKING GAS TANKS

OCCASIONALLY a gasoline tank develops a leak caused by a tiny opening in the seam or around one of the pipe connections. It often is possible to avoid soldering by draining the tank and allowing it to stand several days until it is completely dry. Then openings are plugged and a quart of shellac is poured in. The tank should be shaken so that the shellac will reach every part of the inner surface. Then the shellac is poured out again and the tank allowed to stand in the garage for several days until the shellac dries.

Difficulty may be encountered if the tank contained low grade gasoline. Such gasoline often contains enough kerosene-like material that it will not completely evaporate. Instead an oily film is left which will prevent the shellac from sticking to the metal. In such cases wash out the empty tank with high test gasoline.

FOOT REST FOR COACHES

IN MANY coaches the passengers on the rear seat are placed so far forward that there is a natural tendency to rest the feet against the backs of the front seats with decidedly bad effects on the upholstery. Figure 3 shows how to construct a simple foot rest that can be applied to each front seat to save the upholstery. Angle iron brackets are bent up as shown and attached by wooden screws to the bottom of the seat and the hardwood board attached to the brackets. This can be covered with rubber matting, if desired.

EXTENSION FOR JACK

FIGURE 4 shows a way to form a drop extension out of a heavy piece of strap iron. This drop extension will prove extremely useful in cases where it is necessary to get under the axle when the jack itself is too high. Do not attempt to make the drop extension out of light strap iron. The steel must be so thick that there will be no chance of the weight bending the lower angle and permitting the axle to slip.

The base area of many types of jacks is neither wide enough or long enough. They work well on hard surfaces, but are quite likely to tip over if an attempt is made to use them on sand or soft ground. This is particularly true when an extension is used. It is, therefore, desirable to fit an extra base to the jack as shown.

POPULAR SCIENCE MONTHLY awards each month a prize of $10, in addition to regular space rates, for the best idea sent in for motorists. This month's prize goes to H. W. Swope, Danville, Pa., for his suggestion for repairing leaky auto gas tanks (shown and described in column two).

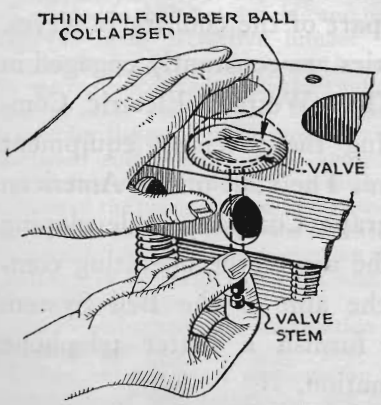


Fig. 2. Ordinary thin rubber ball can be used as satisfactory engine valve tester.

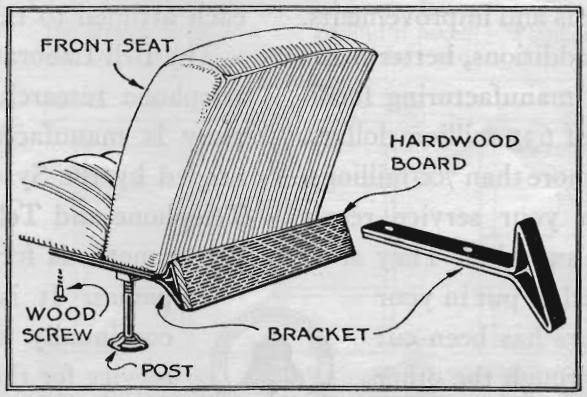


Fig. 3. Angle iron brackets, supporting hard wood board and attached to front seat, make foot rest.

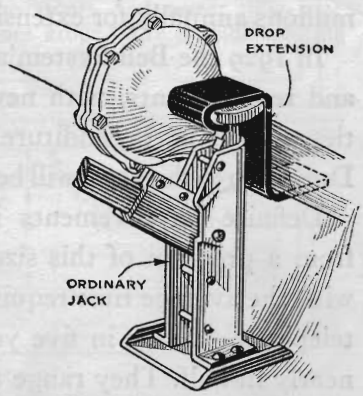


Fig. 4. Heavy strap iron is bent to make drop extension for jack.

Hints for Men Who Work on Cars

Axle wedge stops shimmying.
Rim spreader is easy to make.
Door locks to guard children.

POPULAR SCIENCE MONTHLY awards each month a prize of $10, in addition to regular space rates, for the best idea sent in for motorists. This month's prize goes to Mrs. F. J. Fales, Lyons, N. Y., for her suggestion for a nail lock for rear doors (Fig. 5). Contributions to this department are requested especially from professional auto mechanics.

SHIMMYING and hard steering often are due to a slight inaccuracy in the setting of the king-pin angles. If the king-pins are too nearly vertical, or the king-pins actually lean forward instead of backward, the wheels will not have the proper tendency to straighten out by themselves after rounding a curve.

Figure 1 shows a way to fit the axle to obtain more caster action. Thin wedge-shaped plates should be cut out and bolted between the spring and the spring seat on the axle with the thick end toward the rear. Sometimes only a slight change will make a big difference.

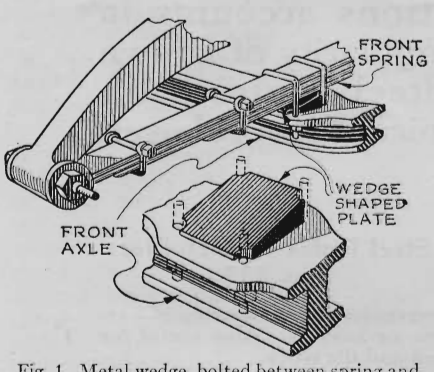


Fig. 1. Metal wedge, bolted between spring and spring seat on axle, will improve steeri... .

REPAIRING BRAKES

IF, THROUGH wear or an accident, one of the connecting lines to a hydraulic brake leaks or is broken off, no pressure can be applied to the other brakes. Under such conditions, the temporary repair shown in Figure 2 will render the three remaining brakes operative. Remove the union. Place a leather washer and the head cut from a nail, as shown. This will seal the joint and allow pressure to be applied to the remaining brakes. This will serve temporarily and permit the driving of the car to a repair shop.

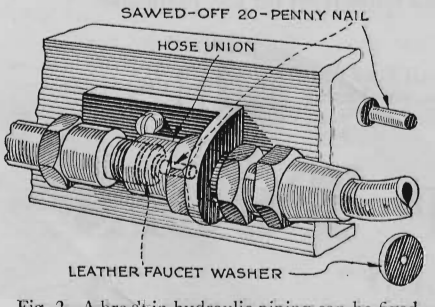


Fig. 2. A break in hydraulic piping can be fixed temporarily with nailhead and leather washer.

RIM SPREADER

THE device shown in Figure 3 will prove serviceable in mounting tires on rims of various sizes. It consists, as shown, of a wooden platform in which three rings of holes are bored part way through. Four-foot lengths of iron pipe are strung together with a wire through holes in the pipe as shown and the top disk is notched to support the other ends of the pipes. By choosing the proper ring of holes it is possible to get a wedge which will spread any rim till it locks. The cost of a rim spreader of this type is low.

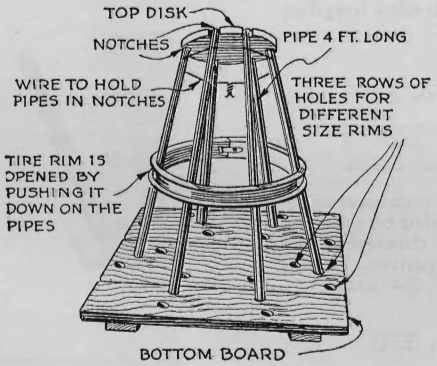


Fig. 3. Spreading a rim is made easy with this device of iron pipes and a wooden platform.

UNMATCHED DOORS

IT IS customary to make the doors of equal width on the ordinary twelve by eighteen foot home garage. With doors of this width it is necessary to open first one door and then go back and open the other one. If one door is made extra wide and the other narrow, as in Figure 4, time is saved because the narrow door can be pushed all the way open even in a strong wind, while a hold is still retained on the other.

An equal amount of time can be saved in closing the doors. Simply walk in with the wide door till you reach a point where the edge of the short door may be grasped and then continue in with both doors.

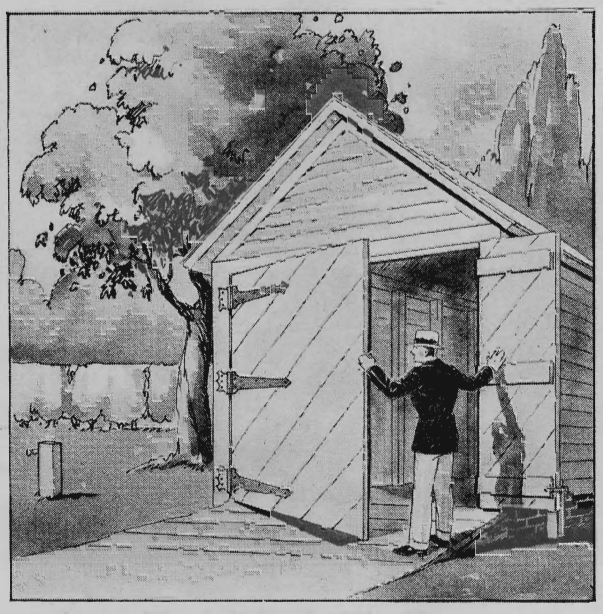


Fig. 4. With garage doors of unequal width, as shown, the opening and closing of them in high wind by one person is simple.

TWO LOCKS FOR DOORS

WHEN children are carried in the back seats of cars fitted with four doors there is always a chance that one of the children may pull open the latch of one of the rear doors and fall out. Figure 5 shows two ways to prevent this trouble. The view at the lower left shows a strap arranged to hold the door latch in a closed position. The upper illustration shows a hole drilled through the door jamb and into the rear door large enough to receive a heavy nail which can be slipped into the hole. So long as the nail is in place the rear door cannot be opened. If possible, select a point for the hole where it will pass through the edge of the latch strike plate so that there will be no tendency for the nail to enlarge the hole.

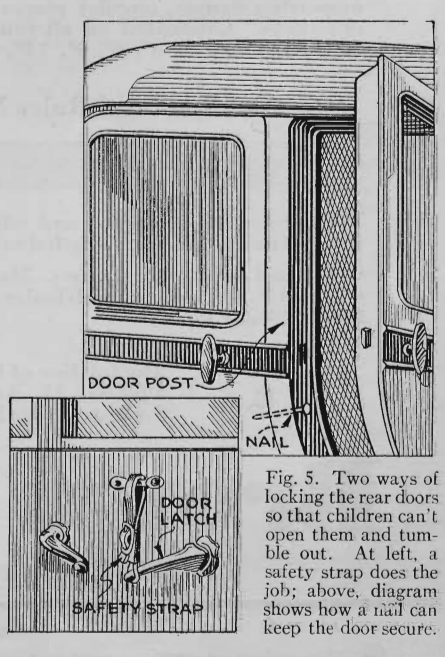
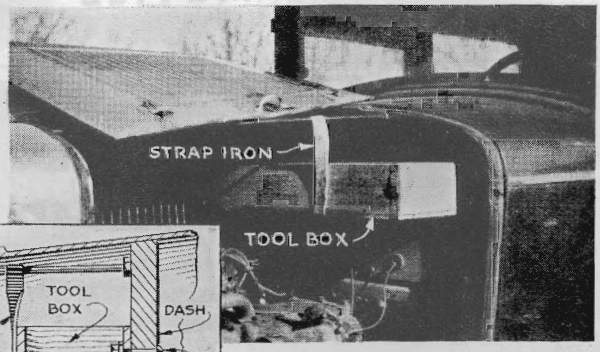


Fig. 5. Two ways of locking the rear doors so that children can't open them and tumble out. At left, a safety strap does the job; above, diagram shows how a nail can keep the door secure.

Helpful Hints for Auto Workers

Tool Box under Hood or Hinged to Dash— Iron Pistons Easily Tested with Magnet

POPULAR SCIENCE MONTHLY awards each month a prize of $10, in addition to regular space rates, for the best idea sent in for motorists. This month's prize goes to Kenneth B. Murray, Sturgis, Mich. (Fig. 4). Contributions are requested from auto mechanics.



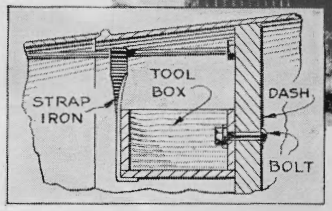


Fig. 1. Tool box fitted under the hood and, left, diagram showing it bolted to the dash and braced with strap iron clamped to radiator rod.

MANY different types of special auto tool boxes have been described in POPULAR SCIENCE MONTHLY. Here are two more. In Fig. 1 is shown a tool box to be fitted under the hood. Modern cars with powerful and compact engines under high hoods make such a tool box possible. In many cars, a still larger tool box would be possible. It should be firmly bolted to the dash and braced with a piece of strap iron clamped to the horizontal rod that keeps the top of the radiator in position.

The tool box shown in Fig. 5 also can be fitted to nearly any car. Because the space arrangement under the cowl makes a shallow tray more practical, a swinging tray of this type will prove useful only for the smaller tools that are most used. The back edge of the tray is hinged to the dash and the latch on the front edge engages with the bead on the lower edge of the instrument panel or a piece of metal bent at right angles.

MAGNET TESTS BEARINGS

IF YOUR motor is fitted with iron pistons, it is possible to test for loose wrist pin or connecting rod bearings by the use of an electromagnet such as is shown in Fig. 2. Of course, it will not work on aluminum alloy pistons. Secure a three-eighth or one-half-inch bolt from fourteen to sixteen inches long. Bend it into a U shape, being sure to have the ends considerably nearer together than the diameter of the cylinder. Place a nut on the threaded end of the bolt and rivet it in place. Now wind the two coils around the ends of the bolt. Use any size wire from twenty-two to twenty-eight and put on as many coils as you can and still keep the outside measurement within the limit of the cylinder diameter. Wind the wire in one direction on one end of the bolt and in the opposite direction on the other end, so as to produce north and south poles.

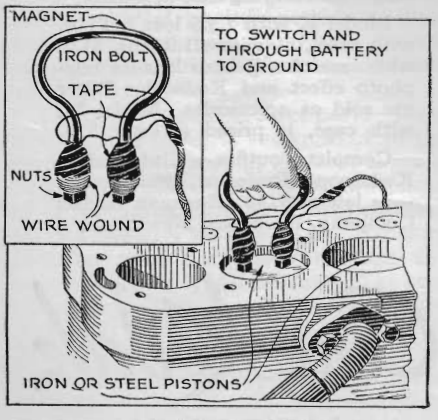


Fig. 2. An iron bolt is bent into horseshoe and wound to form a magnet to test iron pistons.

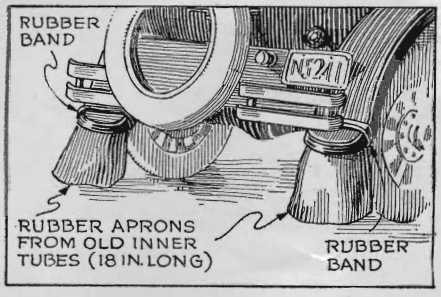


Fig. 3. Fender aprons to keep off mud and tar can be made from old automobile inner tubes.

FENDER APRONS

A DISCARDED inner tube supplies all the material needed for fender aprons (Fig. 3) that will prove especially useful to prevent mud, tar, or slush from splashing all over the body. Cut a pair of heavy rubber bands from the tube, then split a portion of the tube lengthwise and cut the two aprons. The upper edge of the aprons should be sewed with pieces of wire to the rubber bands so that they will be held in place when the bands are snapped over the lower ends of the fenders.

SPEED EASY TO READ

THE miles-per-hour figures on the speedometer can be read much more easily if a special lens is used as shown in Fig. 4. Remove the small bull's-eye lens from the pocket type of flashlight. One side of this type of lens is flat and the other convex. One drop of Canada balsam cement should be placed on the flat side of the lens and spread evenly over the surface. Then the lens should be pressed to the cover glass of the speedometer and held in place till the cement dries. Canada balsam cement is used by lens makers to cement together the sections of lenses and can be obtained from any dealer in optical goods.

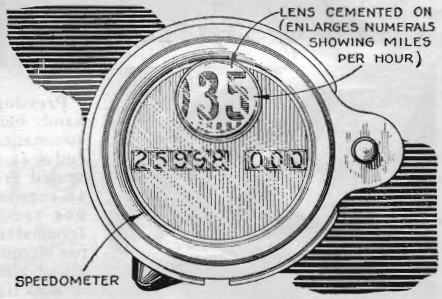


Fig. 4. A bull's-eye lens from a flashlight, fitted over speedometer, magnifies numbers.

Drivers who are annoyed by comments from passengers on the back seat whenever the speedometer registers beyond a certain figure will find that this extra lens cures the trouble by cutting off the view of the speed figures to everyone except the driver.

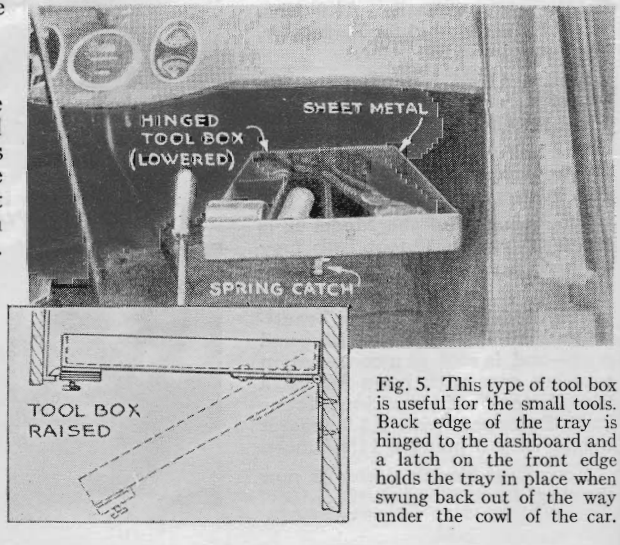


Fig. 5. This type of tool box is useful for the small tools. Back edge of the tray is hinged to the dashboard and a latch on the front edge holds the tray in place when swung back out of the way under the cowl of the car.

Useful Hints for Car Machinists

How to Use Tire Pump to Fill Vacuum Tank —Siphon in Lye Solution to Clean Radiator

PROVIDED the filler cap on the gasoline tank can be screwed down tight enough to prevent much air getting by the threaded portion, Fig. 1 shows a good way to fill the vacuum tank after the car has run out of gasoline. There is always a tiny hole in the cap. By placing the end of the tire pump over this hole and operating the pump plunger several times as rapidly as possible, sufficient gasoline usually can be forced into the vacuum tank to start the engine.

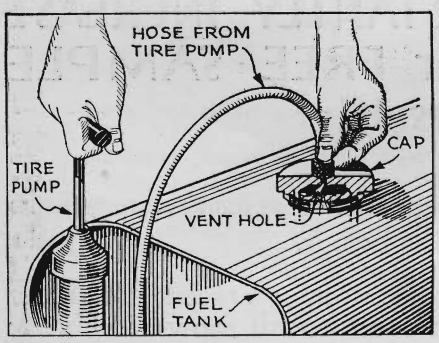


Fig. 1. Raising the air pressure in fuel tank will force gasoline into empty vacuum tank.

SOLDERLESS TANK REPAIR

AN INGENIOUS way to repair a hole in a gasoline tank is shown in Fig. 2. If a hole develops on a flat surface, it can be enlarged to the size of a small screw. Then a disk is cut from the end of a cork and a hole made in it just large enough for the screw, with a washer under the head, to be forced through. With the aid of a wire clip, the screw is passed through the filler hole in the tank and set into the hole. Then a nut is screwed on. The pressure on the cork will make it gas-tight around the screw and against the inner surface of the tank.

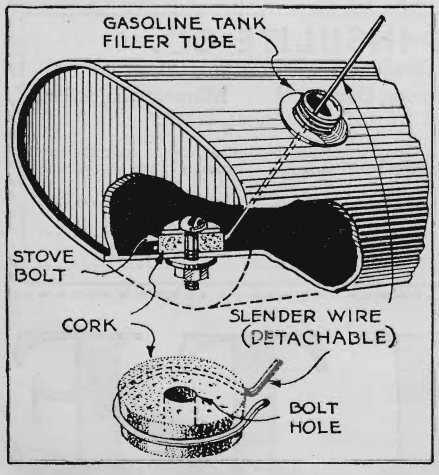


Fig. 2. A cork, a screw, and a washer can be successfully used to repair hole in gas tank.

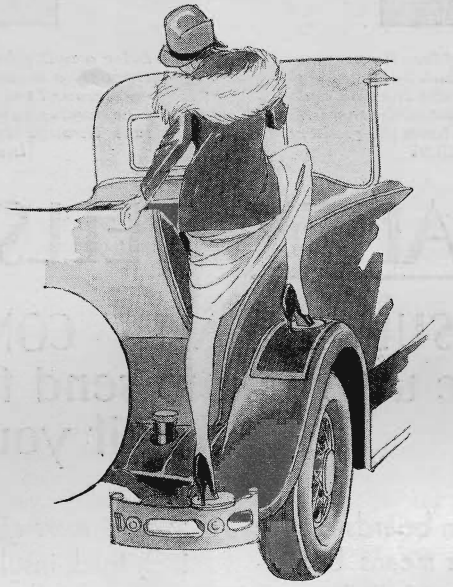


Fig. 3. Putting a rubber mat under the step plate will save the mudguard from scratches.

MUDGUARD SCRATCHES

CLIMBING into the rumble seat of the roadster is easy enough by way of the step plates provided, but the heel often scratches the mudguard enamel around the plate. Remove the step plates on the mudguard; then replace it with a piece of rubber matting under it as shown in Fig. 3.

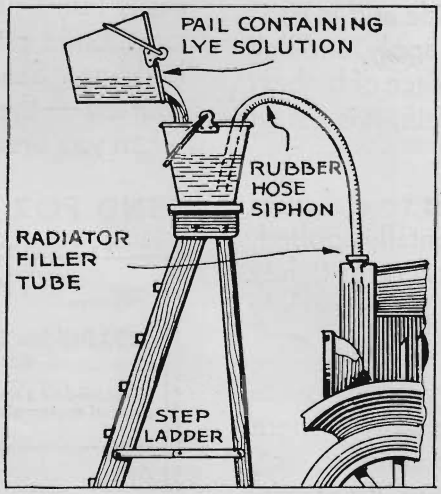


Fig. 4. To save car finish from lye solution start siphon with water and then pour lye in.

POPULAR SCIENCE MONTHLY awards each month a prize of $10, in addition to regular space rates, for the best idea sent in for motorists. This month's prize goes to Walter E. Wikdahl, Brockton, Mass. (Fig. 4). Contributions are requested from auto mechanics.

LYE IN RADIATOR

A SOLUTION of lye is fine for cleaning radiators but it is bad medicine for auto finish. If you want to get the solution in the radiator without spilling any over the car finish, use method shown in Fig. 4.

SIMPLE DOOR STOP

STICKS of wood and a couple of hinges make up the novel and simple door stops shown in Fig. 5. As the drawing shows, two sticks are driven into the ground for each door, one a trifle more than the thickness of a stick lower than the edge of the door and the other to act as a stop. Then sticks are hinged to the uprights.

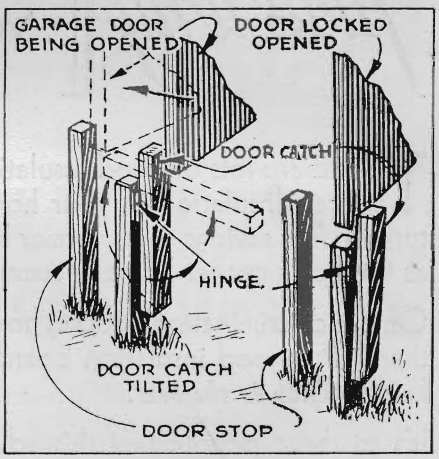


Fig. 5. Hinged sticks set at side of garage door, as shown above, will make a simple door stop.

GET RID OF POUNDING

TOOL marks on the braking surface of the drum may cause a pounding noise. The remedy is to polish out the tool marks as shown in Fig. 6, below.

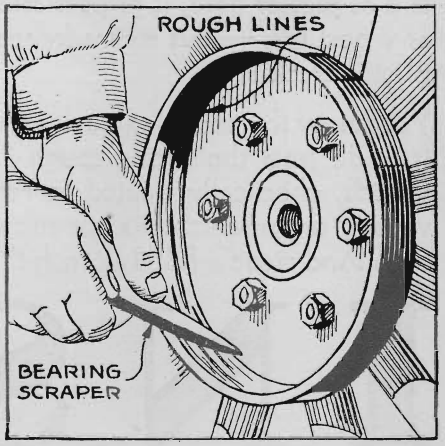


Fig. 6. Tool's marks on braking surface of drum cause pounding. Polishing ends it.

Kinks to Help Auto Mechanics

Novel way of getting clear when blocked by parked cars—How to install neon stop light on any car

WHEN you leave your car parked at the curb and if while you are absent other cars are parked in front and behind yours, you are blocked in if the other cars are locked. A way out is illustrated in Fig. 1. Put your jack under the center of the front axle and work the jack as high as it will go. Then push the car sidewise until it falls off the jack. This will move the front of the car quite a distance out into the street. Repeat the process till you can drive away.

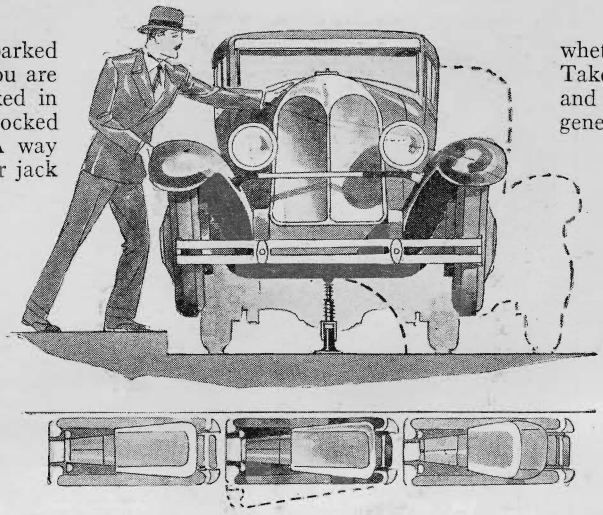


Fig. 1. Shows how a jack can be used to get a car out of a tight place when blocked by autos.

NOVEL CARBON SCRAPER

FIGURE 2 shows how to make a carbon scraper that will cut into and quickly remove the hardest carbon deposit in the cylinder head

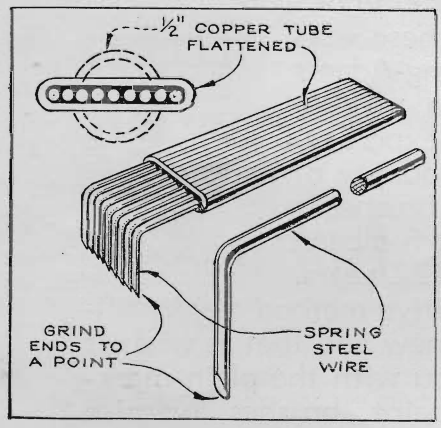


Fig. 2. This tool will scrape away carbon.

or on the pistons. Take a number of pieces of spring steel wire such as piano wire. Cut them to a uniform length. Next, take a piece of copper tubing with an inside diameter of about a half inch and partly flatten it.

Place the wires side by side in the end of the partly flattened tube and hammer the tube till it grips the wires. Bend the ends of the wires down as shown and grind them to a cutting edge. Then stone off the cutting edges a trifle, enough so that they won't bite into the metal. The flexibility of the spring wire makes this tool ideal for scraping carbon from curved surfaces.

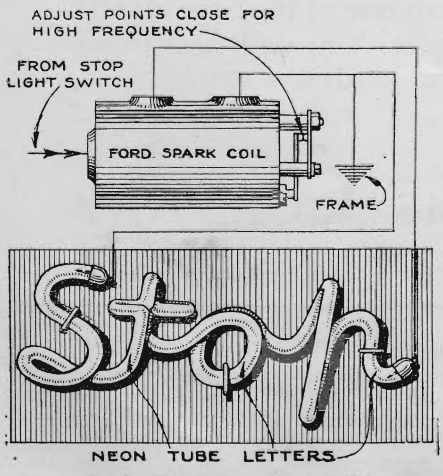


Fig. 3. Ford coil supplies necessary high tension current to operate a red neon stop light.

NEON STOP LIGHT

FIGURE 3 shows a stop light that certainly can be seen. This stop light spells out the word "stop" in the brilliant red of the neon sign. An old Ford coil supplies the necessary high tension current. It should be mounted close to the sign and wired as indicated. No changes need be made in the stop light switch. Simply connect the wire from the stop light switch to the coil. Adjust the vibrator to give as high a note as possible.

GENERATOR TEST

IT IS easy enough to test the windings of a generator to make sure that there are no open circuits. A flashlight bulb connected to the generator will determine whether or not the generator is all right. Take a long nail or a piece of heavy wire and insert it in the lathe center of shaft in generator. Then with a hand drill set over the nail or wire, turn the generator, to which the flashlight bulb has been wired. If the light shines steadily the generator is working satisfactorily, but if the light flickers it is a sign that there is trouble either in the commutator or in the wires.

POPULAR SCIENCE MONTHLY awards each month a prize of $10, in addition to regular space rates, for the best idea sent in for motorists. This month's prize goes to Lemuel Harris, Nogales, Arizona (Figure 5). Contributions are requested from auto mechanics.

VALVE LOCKS

IT IS difficult to install, with the fingers alone, split, tapered valve locks of the kind now used on many cars. To save your nerves and your time, take a piece of thin sheet-iron or tin, snip the ends,

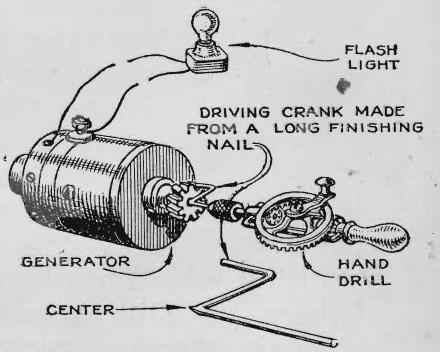


Fig. 4. Simple means of testing a car's generator.

and bend them, as shown in diagram, to fit the valve lock. Place cup grease on the inner surface of the valve so that it will stick in place while the valve spring is being released. The valve locks can be installed easily with this simple tool.

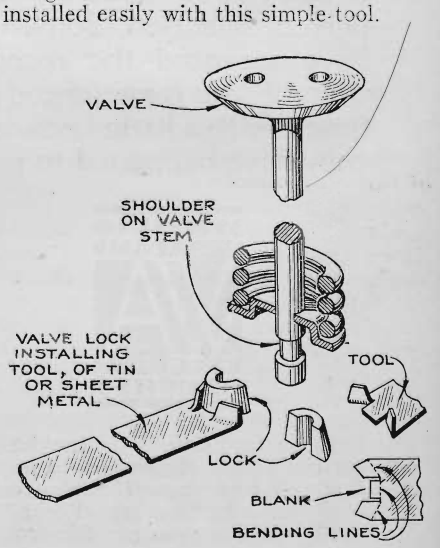


Fig. 5. A valve lock installing tool that is easy to make and will save much wear and tear.

Useful Hints for Car Workers

Spark plugs can be cleaned with heat. How to make self-starter safe from children. Screen door spring will increase your heater's efficiency.

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Fig. 1. Slowly heating a spark plug until it is red-hot and then letting it cool gradually will remove carbon and won't hurt plug.

BOTH the metal body and the insulator of an auto spark plug are built to stand heat, and this fact can be utilized in a novel cleaning method. Grasp the plug by means of a pair of pliers applied to the metallic portion at the top of the insulator and hold it over the flame of a gas stove, as illustrated in Fig. 1, above.

Apply the heat gently at first so as not to crack the insulator and then, after the plug is well warmed, apply the full force of the flame. Get the plug, or at least that portion of the body and insulator that projects into the engine, red-hot and keep it that way for a few minutes. Then set it aside to cool slowly. You will find that the sticky carbon has been reduced to a flaky deposit that can be brushed off.

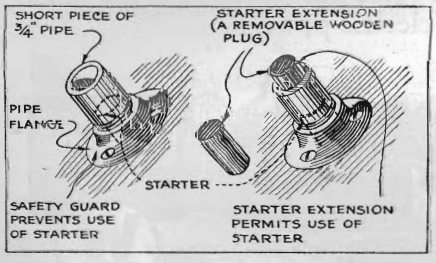

Fig. 2. A pipe flange fitted over starter, with plug to work it, makes car safe for children.

STARTER SAFETY

THERE always is a possibility of a dangerous accident when children are left alone in the car. One of them may press the starter pedal. To avoid this trouble, purchase a pipe flange for a three-quarter-inch pipe and a long three-quarter-inch pipe nipple. Fasten the pipe flange to the floor boards over the self-starter button as illustrated in Fig. 2, then whittle a round wood plug that will fit in the pipe and project above the edge. When you leave the car, take the plug with you and so prevent the self-starter being used.

SIMPLE SCREW HOLDER

THERE are many screws about the auto that are so placed that it is extremely difficult to start them in the hole. The simple tool shown in Fig. 3 will make child's play out of such a job. Take a piece of flat iron or brass strip and bend the ends as shown. Slot one end to the diameter of the largest screw and fit two screw eyes by riveting or soldering.

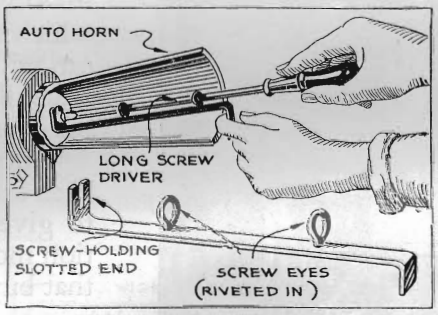

Fig. 3. A slotted piece of flat iron or brass strip serves as a good and simple screw holder.

PIPE BLOW-OUT VALVE

THE easiest way to clean out small piping is to apply air pressure. Unfortunately, the special head on the end of the air pressure hose can only be operated by pressing against the tire valve. Figure 5 shows a way to overcome this difficulty. Take the valve stem from an old tube, file off the flange that rests against the inside of the tube, and so convert it into a tapered end which will fit into the pipe.

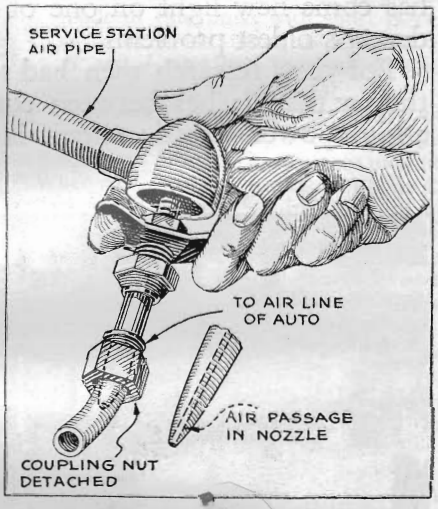

Fig. 5. Valve stem from an old tube, filed down, will fit pipe to be cleaned by air pressure.

USES FOR SPRINGS

FIGURE 4 shows how old screen door springs increase heat radiating surface of a hot air type car heater. Wind the spring around the exhaust pipe as shown. Figure 6 shows screen door springs tightly fastened around the drum of a squeaking brake to muffle the squeak by damping the vibration of the drum.

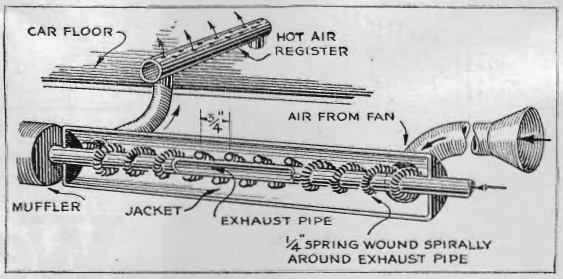

Fig. 4. A spring from an old screen door, wound around exhaust pipe, will increase heat from hot air type heater.

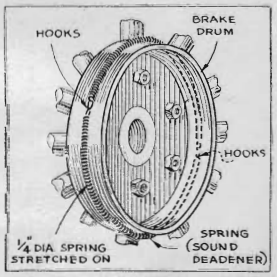

Fig. 6. How squeak in a brake drum can be muffled.